ORDER NO. RD81075217C1

Service Manual

Radio

RF-1401

FM/AM Portable Radio

■ SPECIFICATIONS

Frequency Range:	FM 88 ~ 108MHz AM 525 ~ 1610kHz (571 ~ 187m)
Intermediate Frequency:	FM 10.7MHz AM 455kHz
Sensitivity:	FM 2μV for 50mW Output AM 40μV/m for 50mW Output
Power Source:	AC 120V 60Hz
Power Consumption:	7W
Batteries:	6V (four "D" Size Flashlight Batteries) (Panasonic UM-1 or equivalent)
Power Output:	2.0W ... RMS (max.)
Speaker:	16cm ($6\frac{1}{2}$") PM Dynamic Speaker
Dimensions:	$13\frac{1}{16}$"(Wide) x $8\frac{3}{4}$" (High) x $5\frac{3}{8}$" (Deep) (332 x 223 x 131)mm
Weight:	5 lb. 1 oz. (2.3kg) without batteries
Impedance:	Speaker ..... 8Ω Earphone Jack 8Ω

Specifications are subject to change without notice.

Panasonic®

Panasonic Company
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5770 Ambler Drive, Mississauga, Ontario, L4W 2T3

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Ave, 65 De Intanteria, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

LOCATION OF CONTROLS AND COMPONENTS

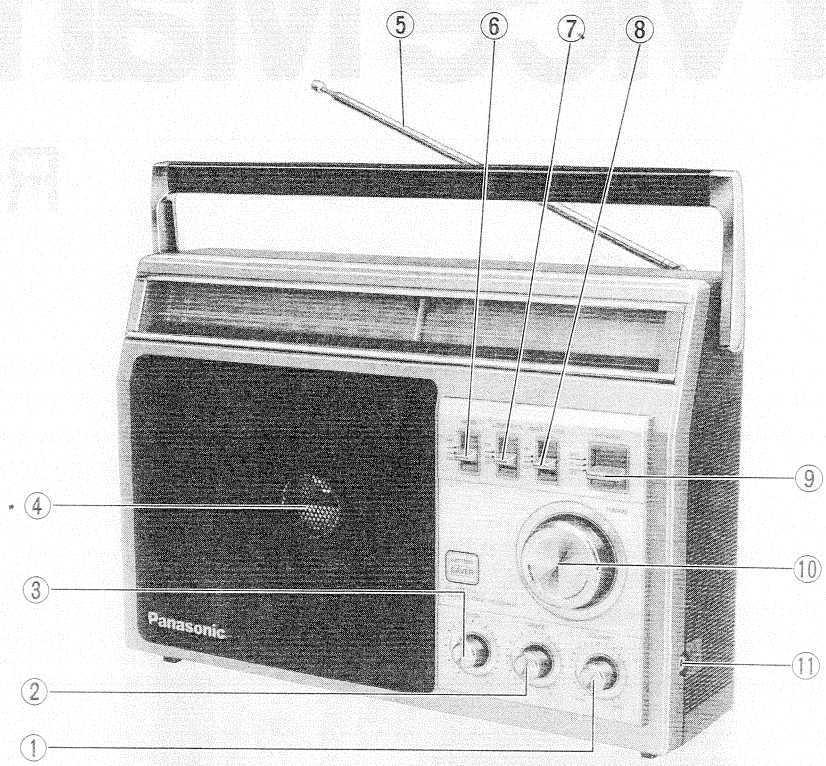


Fig. 1

① Volume control
② Treble control
③ Bass control
④ Speaker [16cm ($6^1/_2$″) 8Ω]
⑤ Telescopic antenna
⑥ Band selector (FM, AM)
⑦ Loudness selector (ON, OFF)
⑧ Battery saver selector (ON, OFF)
⑨ Power selector (BATT, AC, OFF)
⑩ Tuning control
⑪ Earphone jack (IMP 8Ω)

DISASSEMBLY INSTRUCTIONS

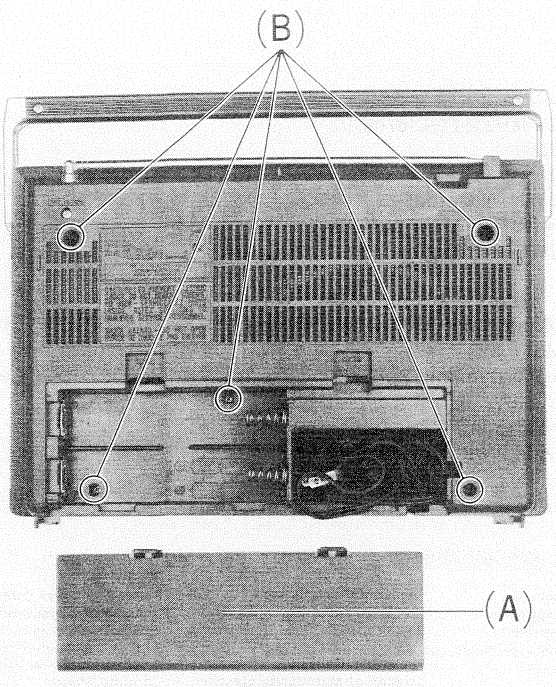


Fig. 2

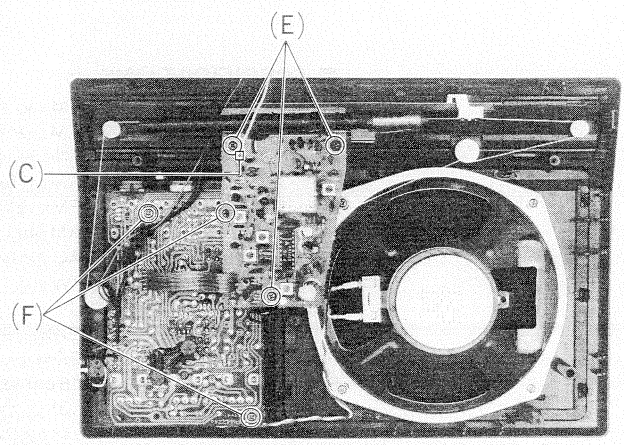


Fig. 3

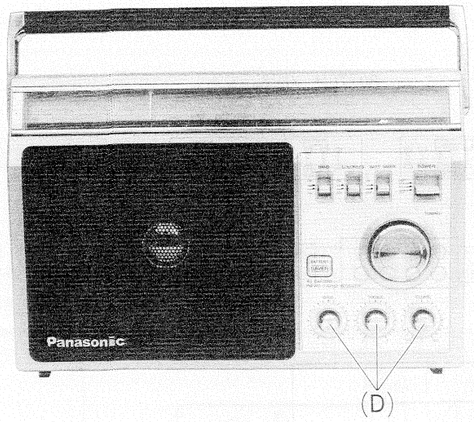


Fig. 4

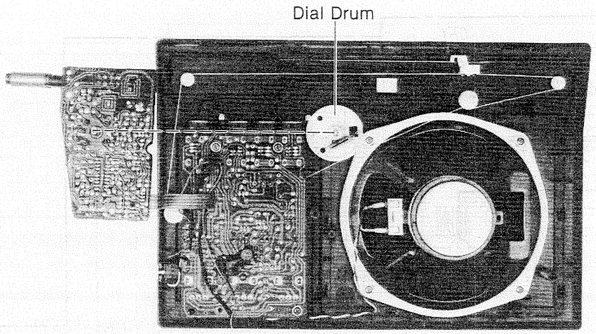


Fig. 5

Procedure	To remove—.	Remove	Shown in fig.—.
1	Rear Cabinet	Battery cover . . . . . (A)	2
2		Screw (3 x 16). . . . . (B) x 5	
3		Socket . . . . . (C)	3
4	Printed Circuit Board	Knob. . . . . (D) x 3	4
5		Red screw (3 x 10) . . . . . (E) x 3	3
6		Red screw (3 x 10) . . . . . (F) x 3	3

Notes:
1. Turn the tuning gang shaft to fully counter-clockwise.
2. When assembling, insert the tuning gang shaft in the hole of dial drum as shown in Fig. 5.

DIAL THREADING

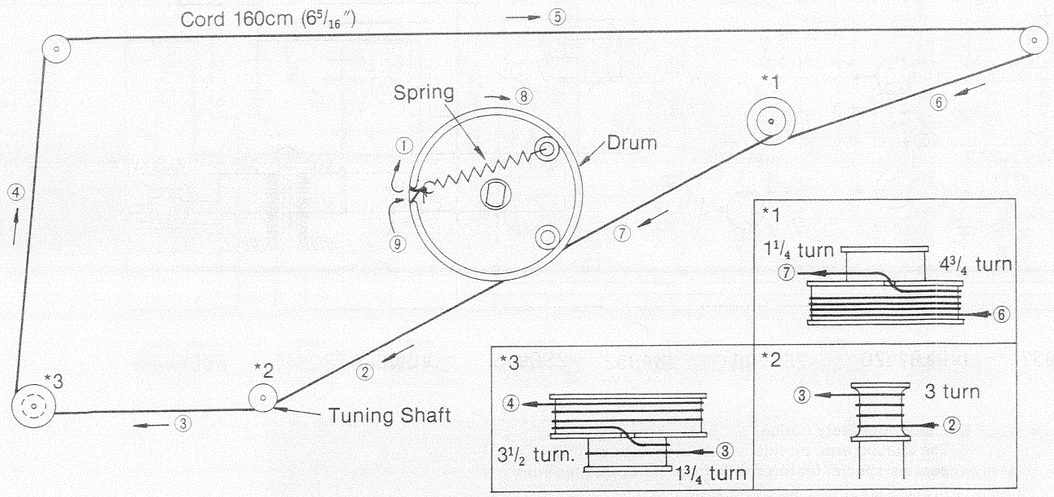


Fig. 6

ALIGNMENTS

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set bass control to center.
2. Set volume control to maximum.
3. Set treble control to center.
4. Set band switch to AM or FM.
5. Set loudness switch to OFF.
6. Set batt saver switch to OFF.
7. Set power source voltage to 6V DC.
8. Set power switch to ON.
9. Output of signal generator should be no higher than necessary to obtain an output reading.

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
		CONNECTIONS	FREQUENCY				
		AM IF ALIGNMENT					
(1)	AM	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455kHz 30% Mod. at 400Hz	Point of non-interference.	Output meter across voice coil.	T2 (AM 1st IFT) T3 (AM 2nd IFT)	Adjust for maximum output.
		AM-RF ALIGNMENT					
(2)	AM	〃	550kHz	550kHz [12.2mm (1/2")]	Ouput meter across voice coil.	L9 (AM OSC Coil) (*1) L8 (AM ANT Coil)	Adjust for maximum output. Adjust L8 by moving coil bobbin along ferrite core.
(3)	AM	〃	1,500kHz	1,500kHz [111.8mm (4 13/32")]	〃	CT4 (AM OSC Trimmer) CT3 (AM ANT Trimmer	Adjust for maximum output. Repeat steps (2) and (3).
		(*1) Cement antenna bobbin with wax after completing alignment.					
		FM-IF ALIGNMENT					
(4)	FM	Connect to test point ▼ through 0.001μF. Negative side to test point ▼.	10.7MHz	Point of non-interference.	Connect vert. amp of scope to test point ▼ Negative side to test point ▼.	T1 (FM 1st IFT)	Adjust for maximum amplitude. (Refer to Fig. 8)
(5)	FM	〃	〃	〃	〃	T4 (FM 2nd IFT)	Adjust for maximum amplitude. (Refer to Fig. 9)
		FM-RF ALIGNMENT					
(6)	FM	Connect to test point ▼ through dummy antenna. Negative side to test point ▼. (Refer to Fig. 10)	90MHz	90MHz [20.0mm (25/32")]	Output meter across voice coil.	L5 (FM OSC Coil) L4 (FM TUNE Coil)	Adjust for maximum output.
(7)	FM		106MHz	106MHz [105.6mm (4 5/32")]	〃	CT2 (FM OSC Trimmer) CT1 (FM TUNE Trimmer)	Adjust for maximum output Repeat steps (6) and (7)

■ ALIGNMENT POINTS

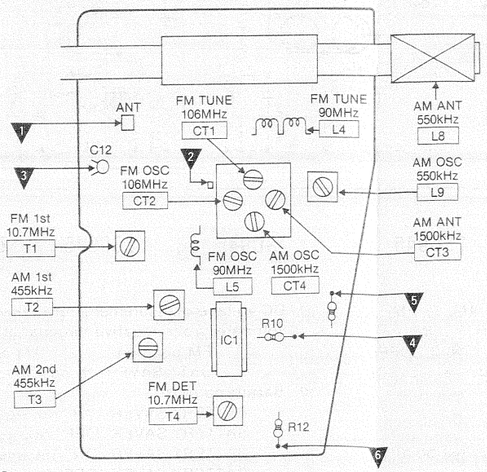


Fig. 7

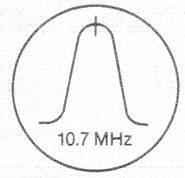


Fig. 8

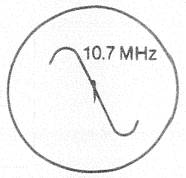
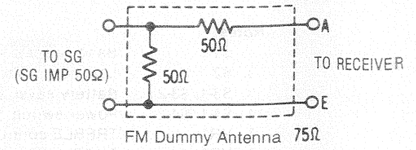


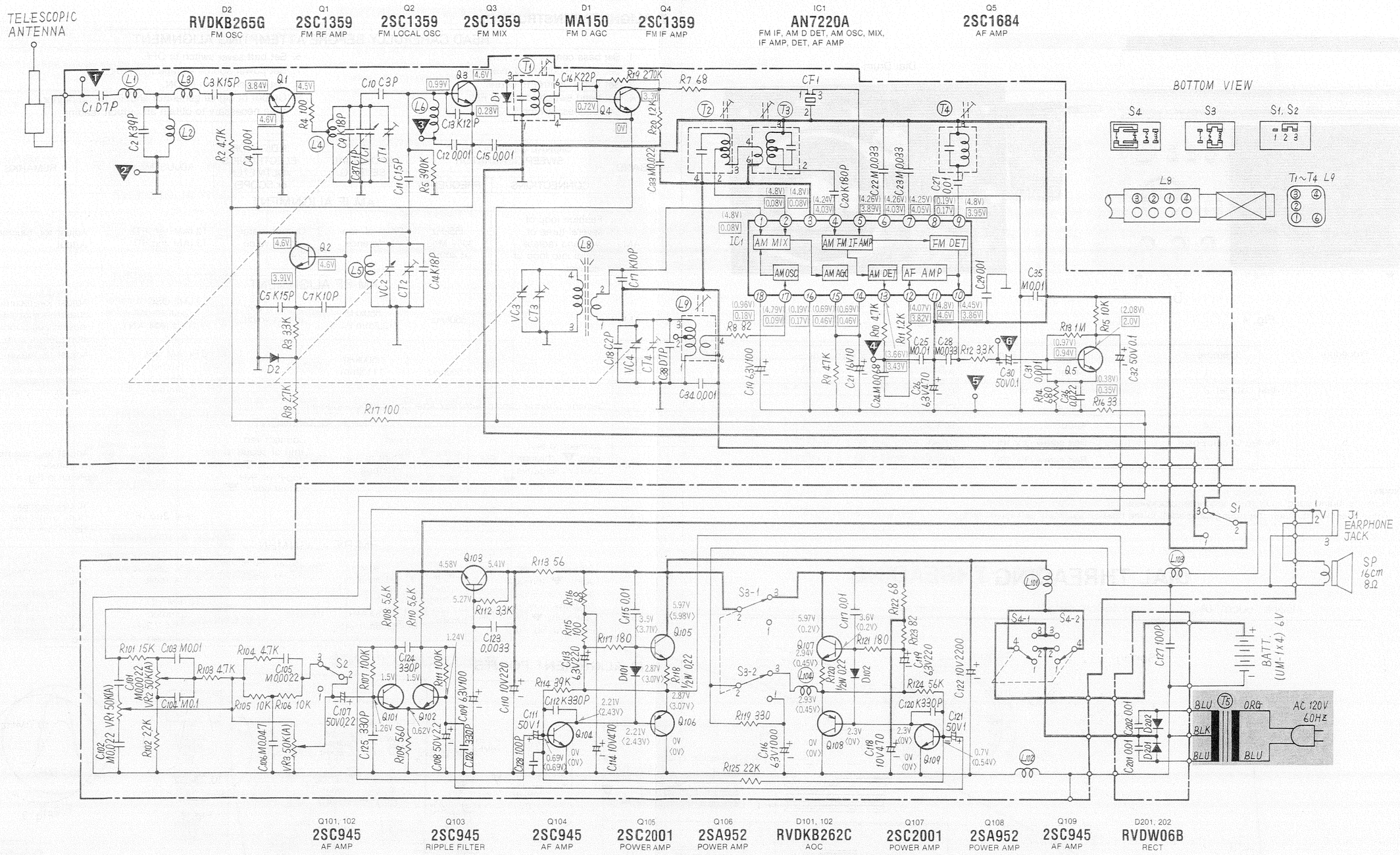
Fig. 9



FM Dummy Antenna 75Ω

Fig. 10

SCHEMATIC DIAGRAM MODEL RF-1401



Notes:

1. S1 .....Band selector switch (1...AM, 3...FM).
2. S2 .....Loudness switch (1...OFF, 3...ON).
3. S3-1, S3-2 .....Battery saver switch (1...ON, 3...OFF).
4. S4-1, S4-2 .....Power switch (1...OFF, 2...AC, 3...DC).
5. VR1 .....TREBLE control.
6. VR2 .....BASS control.
7. VR3 .....VOLUME control.
8. The mark (▼) shows test point e.g. ▼ = Test point 1.
9. DC voltage measurements are taken with electronics voltmeter from negative terminal of battery.
   [ ] ...FM position, ( ) ...AM position,
   < > ...BATT SAVER ON position.
10. Battery current:
    BATTERY SAVER "ON" No. signal 27mV
    BATTERY SAVER "OFF" No. signal 50mA
    BATTERY SAVER "ON" Maximum output 150mA
    BATTERY SAVER "OFF" Maximum output ...450mA
11. Important safety notice.
    The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.
    When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM MODEL RF-1401

Q1	FM
C	4.5V
B	4.6V
E	3.84V

Q2	FM
C	4.6V
B	4.6V
E	3.91V

Q3	FM
C	4.6V
B	0.99V
E	0.28V

TELESCOPIC ANTENNA

Q103	
C	5.41V
B	5.27V
E	4.58V

Q104	BATT	SAVER ON
C	2.21V	2.43V
B	0.69V	0.69V
E	0V	0V

Q101	
C	1.5V
B	1.26V
E	0.62V

Q102	
C	1.5V
B	1.24V
E	0.62V

SPEAKER
16cm (5/8") 8Ω

Q106	BATT	SAVER ON
C	0V	0V
B	2.21V	2.43V
E	2.87V	3.07V

J1 : EARPHONE JACK

BATTERY 6V
(UM-1×4)

Q4	
C	3.3V
B	0.72V
E	0V

Q5	FM	AM
C	2.0V	2.08V
B	0.94V	0.97V
E	0.35V	0.38V

IC1

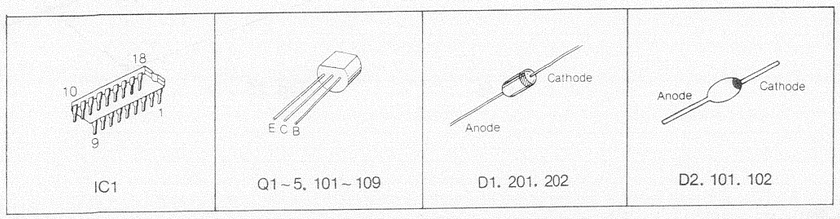
	FM	AM		FM	AM		FM	AM
1	0.08V	4.8V	7	4.05V	4.25V	13	3.43V	3.66V
2	0.08V	4.8V	8	0.17V	0.19V	14	0.46V	0.69V
3	0.08V	4.8V	9	3.95V	4.8V	15	0.46V	0.69V
4	4.03V	4.24V	10	3.86V	4.45V	16	0.17V	0.19V
5	3.89V	4.26V	11	4.6V	4.8V	17	0.09V	4.79V
6	4.03V	4.26V	12	3.82V	4.07V	18	0.18V	0.96V

Q108	BATT	SAVER ON
C	0V	0V
B	2.3V	0V
E	2.93V	0.45V

Q109	BATT	SAVER ON
C	2.3V	0V
B	0.7V	0.54V
E	0V	0V

Q105	BATT	SAVER ON
C	5.97V	5.98V
B	3.5V	3.71V
E	2.87V	3.07V

Q107	BATT	SAVER ON
C	5.97V	0.2V
B	3.6V	0.2V
E	2.94V	0.45V



BLK
BLU
ORG
BLU
BLU
AC POWER CORD

T5 : POWER TRANSFORMER

CABINET PARTS LOCATION

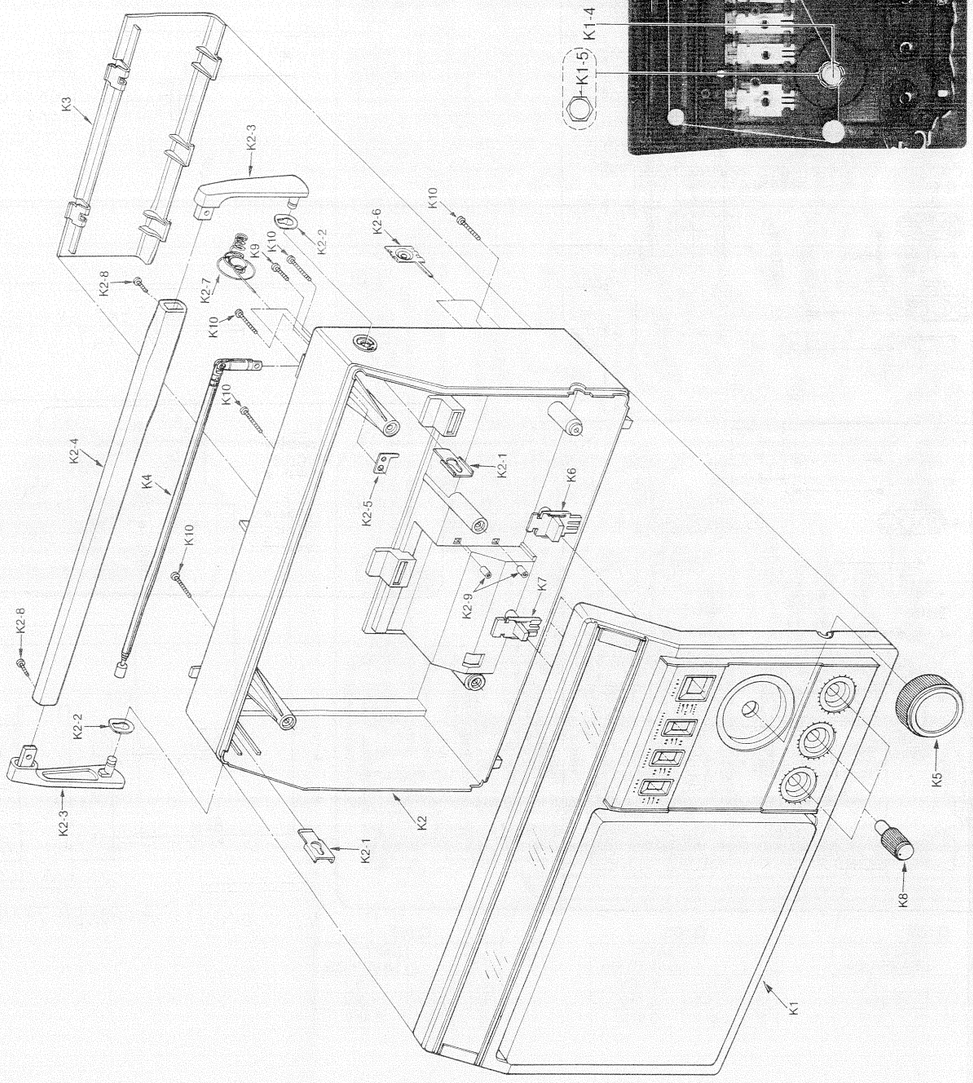


Fig. 11

ELECTRICAL PARTS LOCATION

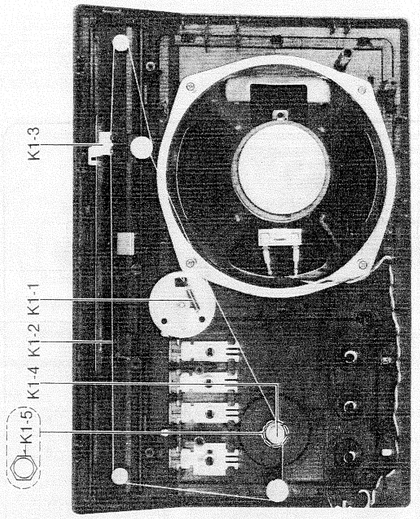


Fig. 12

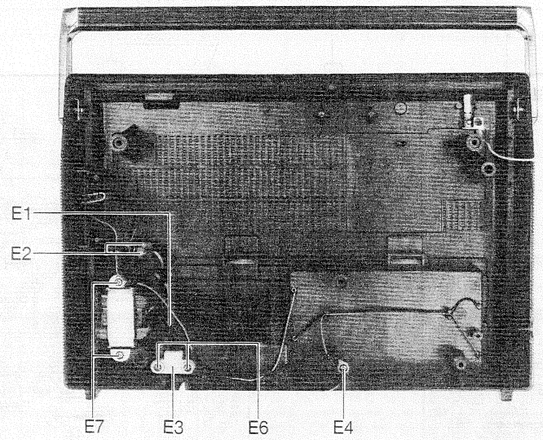


Fig. 13

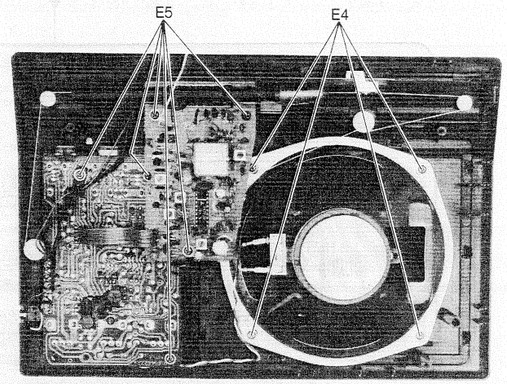
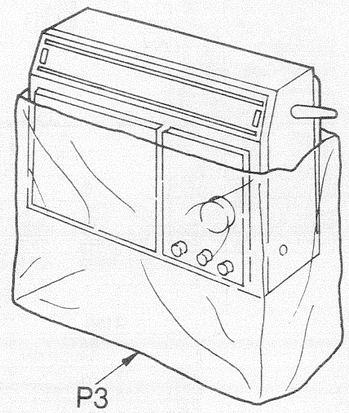


Fig. 14

PACKING



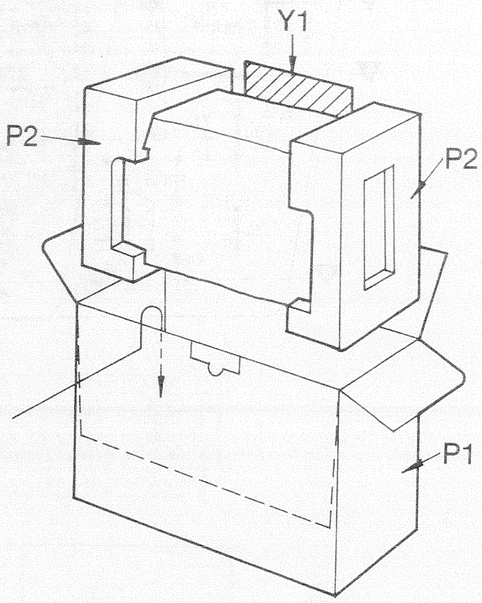


Fig. 15

■REPLACEMENT PARTS LIST .....Model RF-1401

(RD81075217C1)

NOTES: 1.Important safety notice.
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
2.The S mark indicates service standard parts and may differ from production parts.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		INTEGRATED CIRCUIT, TRANSISTORS AND DIODES		
IC1	AN7220A	IC	1	
Q1∿4	2SC1359B	Transistor (Si)	4	S
Q5	2SC1685-Q	Transistor (Si)	1	S
Q101,102,	103,104,109			
	2SC945-Q	Transistor (Si)	5	S
Q105,107	2SC2001L1	Transistor (Si)	2	
Q106,108	2SA952L1	Transistor (Ge)	2	
D1	MA161	Diode (Si)	1	S
D2	RVDKB265G	Diode (Si)	1	S
D101,102	RVDKB262C	Diode (Si)	2	S
D201,202	RVDW06B	Diode (Si)	2	
		COILS AND TRANSFORMERS		
L4	RLO4Y54	Antenna Coil, FM	1	
L5	RLD4Y53	Oscillator Coil, FM	1	
L8	RLF2F48	Antenna Coil, AM	1	
L9	RLO2B87	Oscillator Coil, AM	1	
T1,4	RLI4B153	IFT, FM 1st, FM Detector	2	
T2	RLI2B216	IFT, AM 1st	1	
T3	RLI2B217	IFT, AM 2nd	1	
T5	RLT5J310C	Power Transformer	1	⚠
		VARIABLE RESISTOR		
VR1∿3	EVH0XAF15A54	Variable Resistor, 50kΩ (A)	3	
		VARIABLE CAPACITOR		
VC1∿4	RCV4LC2V1L	Tuning Capacitor, w/Trimmer Capacitor (CT1∿4)	1	
		CERAMIC FILTER		
CF1	RVFSFE107MSR	Ceramic Filter	1	
		SPEAKER		
	EAS16P203S	Speaker, 16cm (6-1/2"), 8Ω	1	
		SWITCHES		
S1,2	RSS2A31Z	Switch, Band Selector, Loudness	2	
S3	RSS2B29Z	Switch, Battery Saver	1	
S4	RSS3A05Z	Switch, Power	1	
		JACK		
J1	RJJ13B	Jack, Earphone	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		RESISTORS (Value is in OHMS)		
R2	ERD25FJ472	4.7 k 1/4W Carbon	1	S
R3	ERD25FJ332	3.3 k " "	1	S
R4	ERD25FJ101	100 " "	1	S
R5	ERD25TJ394	390 k " "	1	S
R7	ERD25FJ680	68 " "	1	S
R8	ERD25FJ820	82 " "	1	S
R9	ERD25FJ473	47 k " "	1	S
R10	ERD25FJ472	4.7 k " "	1	S
R11	ERD25FJ122	1.2 k " "	1	S
R12	ERD25FJ332	3.3 k " "	1	S
R13	ERD25TJ105	1 M " "	1	S
R14	ERD25FJ681	680 " "	1	S
R15	ERD25FJ103	10 k " "	1	S
R16	ERD25FJ330	33 " "	1	S
R17	ERD25FJ101	100 " "	1	S
R18	ERD25FJ272	2.7 k " "	1	S
R19	ERD25TJ274	270 k " "	1	S
R20	ERD25FJ122	1.2 k " "	1	S
R101	ERD25FJ153	15 k " "	1	S
R102	ERD25FJ222	2.2 k " "	1	S
R103,104	ERD25FJ472	4.7 k " "	2	S
R105,106	ERD25FJ103	10 k " "	2	S
R107	ERD25TJ104	100 k " "	1	S
R108	ERD25FJ562	5.6 k " "	1	S
R109	ERD25FJ561	560 " "	1	S
R110	ERD25FJ562	5.6 k " "	1	S
R111	ERD25TJ104	100 k " "	1	S
R112	ERD25FJ332	3.3 k " "	1	S
R113	ERD25FJ560	56 " "	1	S
R114	ERD25FJ563	56 k " "	1	S
R115	ERD25FJ820	82 " "	1	S
R116	ERD25FJ680	68 " "	1	S
R117	ERD25FJ181	180 " "	1	S
R118	ERX12ANJR22	0.22 1/2W Metal Oxide	1	S
R119	ERD25FJ331	330 1/4W Carbon	1	S
R120	ERX12ANJR22	0.22 1/2W Metal Oxide	1	S
R121	ERD25FJ181	180 1/4W Carbon	1	S
R122	ERD25FJ680	68 " "	1	S
R123	ERD25FJ820	82 " "	1	S
R124	ERD25FJ563	56 k " "	1	S
R125	ERD25FJ223	22 k " "	1	S
		CAPACITORS (Value is in MICRO FARADS except P.P=PICO FARADS)		
C1	ECCD1H070DC	7 P 50V Ceramic	1	
C2	ECCD1H390K	39 P " "	1	
C3	ECCD1H150K	15 P " "	1	
C4	ECKD1H102ZF	0.001 " "	1	
C5	ECCD1H150KC	15 P " "	1	
C7	ECCD1H100KC	10 P " "	1	
C9	ECCD1H180KC	18 P " "	1	
C10	ECCD1H030CC	3 P " "	1	
C11	ECCD1H1R5CC	1.5 " "	1	
C12	ECKD1H102ZF	0.001 " "	1	
C13	ECCD1H120KC	12 P " "	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C14	ECCD1H180KC	18 P 50V Ceramic	1	
C15	ECKD1H102ZF	0.001 " "	1	
C16	ECCD1H220KC	22 P " "	1	
C17	ECCD1H100KC	10 P " "	1	
C18	ECCD1H020CC	2 P " "	1	
C19	ECEA1AS101	100 10V Electrolytic	1	S
C20	ECCD1H181K	180 P 50V Ceramic	1	
C21	ECEA1HS100	10 " Electrolytic	1	S
C22,23	ECFVD333MD	0.033 25V Semi-Conductor	2	
C24	ECFVD683MD	0.068 " "	1	
C25	ECFVD103MD	0.01 " "	1	
C26	ECEA0JS471	470 6.3V Electrolytic	1	S
C27	ECKD1H103ZF	0.01 50V Ceramic	1	
C28	ECFVD333MD	0.033 25V Semi-Conductor	1	
C29	ECKD1H103ZF	0.01 50V Ceramic	1	
C30	ECEA50ZR1	0.1 " Electrolytic	1	S
C31	ECKD1H102ZF	0.001 " Ceramic	1	
C32	ECEA50ZR1	0.1 " Electrolytic	1	S
C33	ECFVD223MD	0.022 25V Semi-Conductor	1	
C34	ECKD1H102ZF	0.001 50V Ceramic	1	
C35	ECKD1H103MD	0.01 " "	1	
C36	ECFVD223MD	0.022 25V Semi-Conductor	1	
C37	ECCD1H010CC	1 P 50V Ceramic	1	
C38	ECCD1H070DC	7 P " "	1	
C101	ECKD1H222MD	0.0022 " "	1	
C102	ECFVD223MD	0.022 25V Semi-Conductor	1	
C103	ECFVD103MD	0.01 " "	1	
C104	ECFVD104MD	0.1 " "	1	
C105	ECKD1H222MD	0.0022 50V Ceramic	1	
C106	ECFVD473MD	0.047 25V Semi-Conductor	1	
C107	ECEA50ZR22	0.22 50V Electrolytic	1	S
C108	ECEA50Z2R2	2.2 " "	1	S
C109	ECEA1AS101	100 10V "	1	S
C110	ECEA1AS221	220 " "	1	S
C111	ECEA50Z1	1 50V "	1	S
C112	ECCD1H331K	330 P " Ceramic	1	
C113	ECEA1AS221	220 10V Electrolytic	1	S
C114	ECEA1AS471	470 " "	1	S
C115	ECKD1H103ZF	0.01 50V Ceramic	1	
C116	ECEA0JS102	1000 6.3V Electrolytic	1	S
C117	ECKD1H103ZF	0.01 50V Ceramic	1	
C118	ECEA1AS471	470 10V Electrolytic	1	S
C119	ECEA1AS221	220 " "	1	S
C120	ECCD1H331K	330 P 50V Ceramic	1	
C121	ECEA50Z1	1 " Electrolytic	1	S
C122	ECEA1CS222	2200 16V "	1	S
C123	ECKD1H332MD	0.0033 50V Ceramic	1	
C124,125,126	ECCD1H331K	330 P " "	3	
C127,128	ECCD1H101K	100 P " "	2	
C201,202	ECKD1H103ZF	0.01 " "	2	
		CABINET PARTS		
K1	RYMF1401MKS8	Front Cabinet Ass'y	1	
K1-1	RDS4090A	Spring, Dial Drum	1	
K1-2	RDZ05A	Dial Cord (160cm)	1 ROLL	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
K1-3	RDP835Z	Pointer Dial	1	
K1-4	RDT6221Z	Tuning Shaft	1	
K1-5	XNS9	Nut, Tuning Shaft M'tg	1	
K2	RYFF1401MKS7	Rear Cabinet Ass'y	1	
K2-1	QBT1817	Spring, Handle M'tg	2	
K2-2	RKX184Z	Spacer, Handle	2	
K2-3	RKX198Z	Arm, Handle	2	
K2-4	RKX225Z7	Handle	1	
K2-5	RJT711Z	Terminal, Telescopic Antenna	1	
K2-6	RJC111A	Terminal, Battery + Side	2	
K2-7	RJC505Z	Terminal, Battery - Side	2	
K2-8	XSB3+6BN	Screw, + 3x6	2	
K2-9	RJT398A	Pipe, Battery Spring	2	
K3	RKK211Z7	Cover, Battery	1	
K4	XEAQCR228EBY	Telescopic Antenna	1	
K5	RBN577Z	Knob Tuning	1	
K6	RBN578Z	Knob, Power	3	
K7	RBS183Z	Knob, Band, Loudness, Batt. Saver	1	
K8	RBS184Z	Knob, Bass. Treble, Volume	3	
K9	XSB3+10BNS	Screw, + 3x10	1	
K10	XTB3+16CFN	Screw, + 3x16	5	
		ELECTRICAL PARTS		
E1	RJA9W	AC Power Cord	1	⚠
E2	RHR108A	Connecting Pipe, AC Power Cord	2	⚠
E3	RHR134Z	Grammet, AC Power Cord	1	⚠
E4	XTW3+10F	Screw, + 3x10	5	
E5	XTW3+10FR	Red Screw, + 3x10	6	
E6	XTW3+16F	Screw, + 3x16	2	
E7	XTW3+12F	Screw, + 3x12	2	
		ACCESSORY		
A1	XEH1A1-P	Earphone	1	S
		PACKING MATERIALS		
P1	RPK1174Z	Gift Box	1	
P2	RPN9380Z	Pad	1	
P3	XZB45X40A04	Poly Bag	1	
		PRINTED MATERIAL		
Y1	RQX6770Z	Instruction Book	1	

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